



## Unit 3 Lesson 1

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### Are They Similar?

- 1 How do the dimensions of Rectangle B compare to the dimensions of Rectangle C?
- 2 Are Rectangle B and Rectangle C similar? How do you know?
- 3 How do the dimensions of Rectangle A compare to the dimensions of Rectangle C?
- 4 Are Rectangle A and Rectangle C similar? How do you know?
- 5 How do the dimensions of Rectangle A compare to the dimensions of Rectangle D?
- 6 Are Rectangle A and Rectangle D similar? How do you know?
- 7 Cut out a new rectangle that is similar to Rectangle D. Label this Rectangle E.
  - a) What are the dimensions of Rectangle E?
  - b) How do you know that Rectangle E is similar to Rectangle D?
  - c) Are there any other rectangles in your set that are similar to Rectangle E? If so, name them and describe how you know that they are similar.



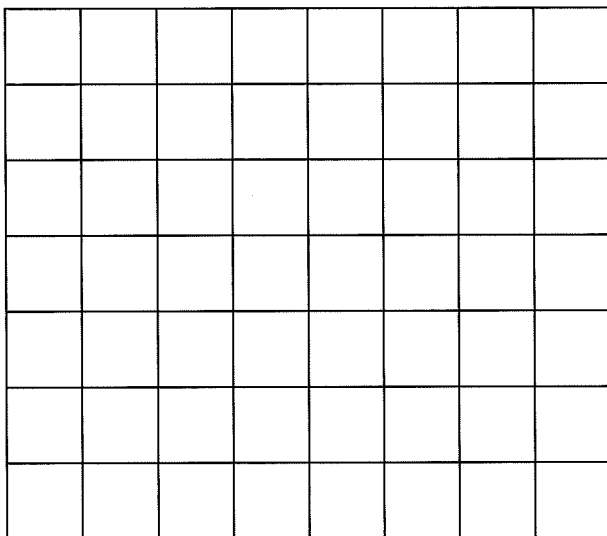
## Sticky Similarities

Part I

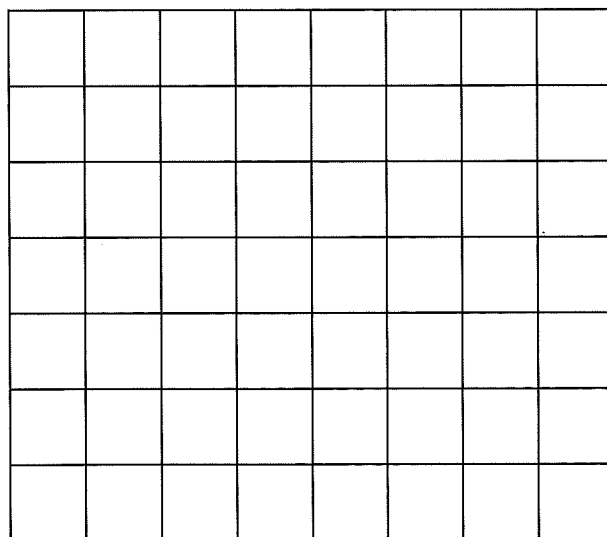
Complete Step 1. Verify your solution with your partner, then complete Step 2. Again, verify your solution with your partner, then complete Step 3.

**Step 1**

Draw a right triangle with a base length of 4 centimeters and a height of 3 centimeters. Label the triangle "A."

**Step 2**

Draw a triangle that is similar to Triangle A after a scale factor of 2 has been applied. Label the triangle "B."

**Step 3**

- 1 a) What is the ratio of the length of the base of Triangle B to the length of the base of Triangle A?
  
- b) What is the ratio of the height of Triangle B to the height of Triangle A?
  
- c) How do these ratios compare to the scale factor that was applied to Triangle A to create Triangle B?
  
- 2 a) What is the ratio of the length of the base of Triangle A to the length of the base of Triangle B?
  
- b) What is the ratio of the height of Triangle A to the height of Triangle B?
  
- c) How do these ratios compare to the scale factor that was applied to Triangle A to create Triangle B?



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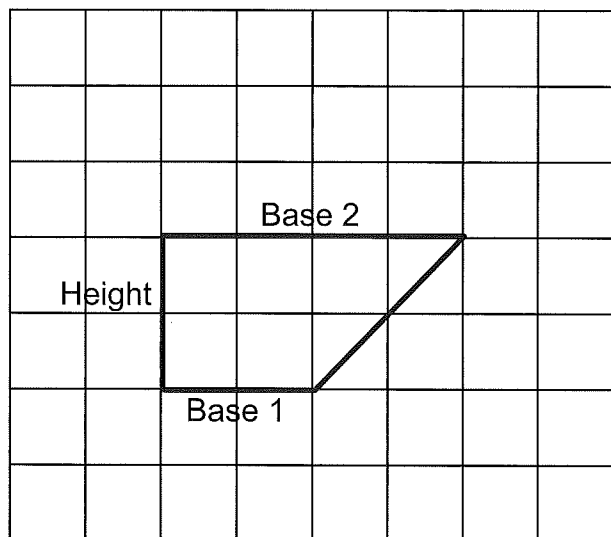
### Sticky Similarities

#### Part II

Complete Step 1. Verify your solution with your partner, then complete Step 2. Again, verify your solution with your partner, then complete Step 3.

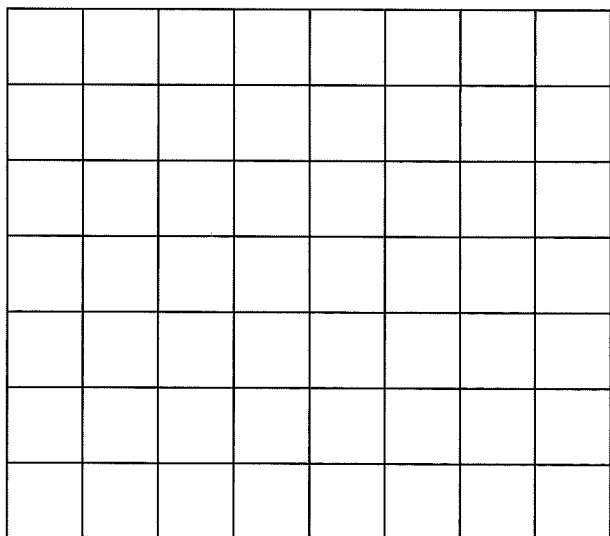
#### Step 1

Measure and label the base lengths and height of the trapezoid shown below. Label the trapezoid "A."



#### Step 2

Draw a trapezoid that is similar to Trapezoid A after a scale factor of 1.5 has been applied. Label the trapezoid "B."



#### Step 3

- 1 a) What is the ratio of the length of Base 1 of Trapezoid B to the length of Base 1 of Trapezoid A?
  - b) What is the ratio of the length of Base 2 of Trapezoid B to the length of Base 2 of Trapezoid A?
  - c) What is the ratio of the height of Trapezoid B to the height of Trapezoid A?
  - d) How do these ratios compare to the scale factor that was applied to Trapezoid A to create Trapezoid B?
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- 2 a) What is the ratio of the length of Base 1 of Trapezoid A to the length of Base 1 of Trapezoid B?
  - b) What is the ratio of the length of Base 2 of Trapezoid A to the length of Base 2 of Trapezoid B?
  - c) What is the ratio of the height of Trapezoid A to the height of Trapezoid B?
  - d) How do these ratios compare to the scale factor that was applied to Trapezoid A to create Trapezoid B?

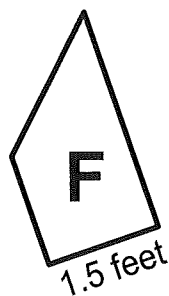


## Sticky Similarities

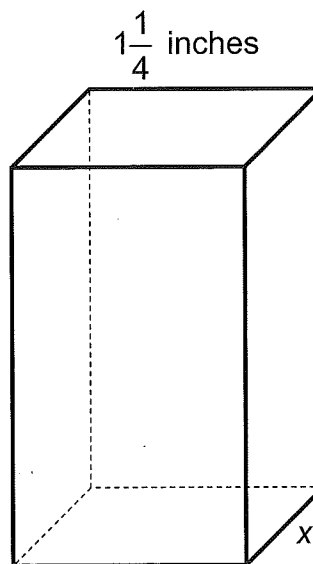
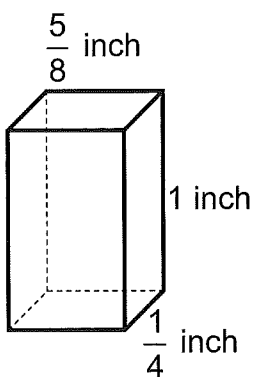
Part III

Work with your partner to solve the following problems:

- 1 Trapezoid F, shown below, is similar to Trapezoid A (from Part II). What are the lengths of the bases of Trapezoid F? Label these lengths on the picture below.



- 2 The 2 rectangular prisms shown below are similar. Find the value of x.





## Unit 3 Lesson 1

### Independent Practice

When 2 figures are similar, their corresponding side lengths are proportional and their corresponding angles are congruent.

Triangle  $ABC$  is similar to Triangle  $XYZ$ .

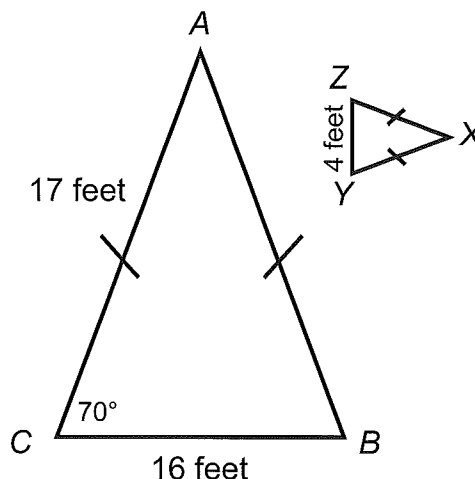
Find the length of  $\overline{XZ}$  and the measure of  $\angle X$ .

To find the length of  $\overline{XZ}$ : We can use the ratio of the bases of the triangles to solve a proportion:

$$\frac{\text{base of } \triangle XYZ}{\text{base of } \triangle ABC} = \frac{4 \text{ feet}}{16 \text{ feet}}$$

Since the figures are similar, this ratio must be equal to the ratio of the other corresponding sides:

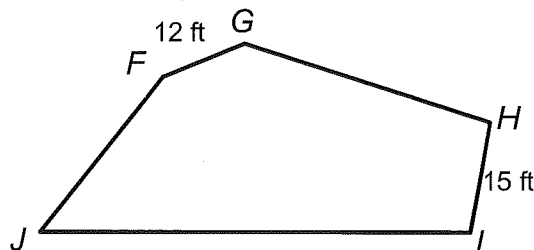
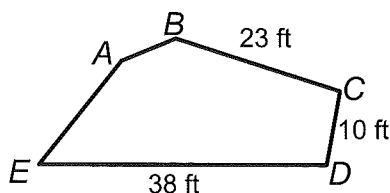
$$\frac{4 \text{ feet}}{16 \text{ feet}} = \frac{XZ}{17 \text{ feet}}$$



We can solve the proportion to determine that  $XZ = 4.25$  feet.

To find the measure of  $\angle X$ : We know that base angles of an isosceles triangle are congruent, so  $\angle B$  must also be  $70^\circ$ . Since the sum of the angles of a triangle must be  $180^\circ$ , we can determine that the measure of  $\angle X$  (which corresponds to  $\angle A$ ) must be  $40^\circ$ .

- 1 Figure  $ABCDE$  is similar to figure  $FGHIJ$ . Determine the scale factor that was applied to Figure  $ABCDE$  to create figure  $FGHIJ$ , then find the lengths of  $\overline{AB}$ ,  $\overline{JI}$ , and  $\overline{GH}$ .

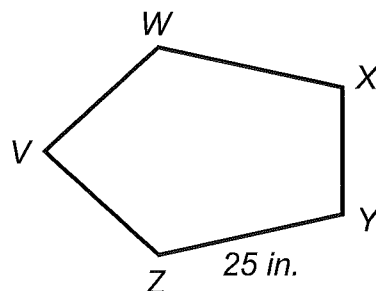
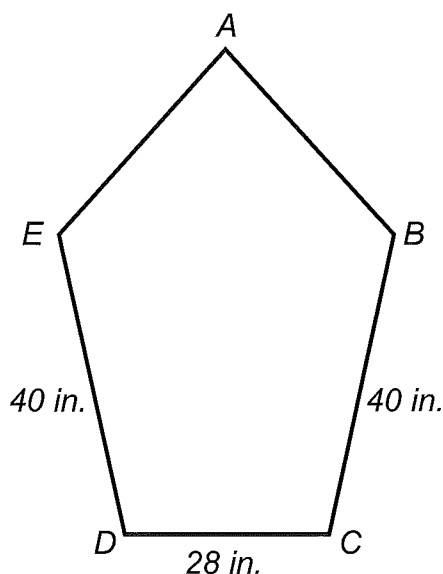


- 2 A board game is being reduced in size to create a travel-size version of the game. The original board has a length of 24 inches and a width of 20 inches. The travel-size board has a width of 12 inches. What should the length of the travel-size board be so that the 2 boards are similar?

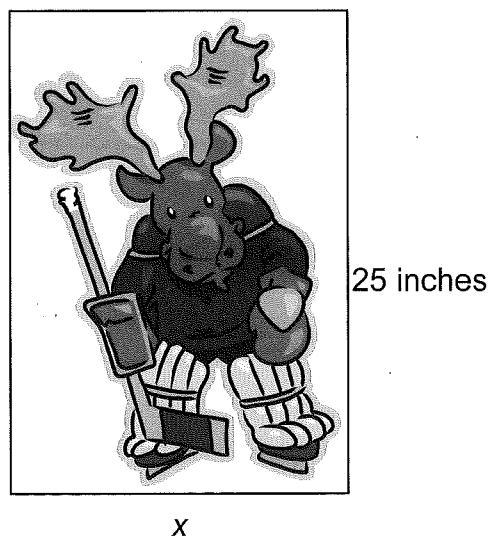
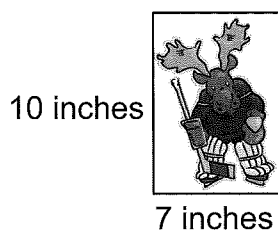


- 3 The foundation of a house is rectangular with a length of 48 feet and a width of 30 feet. The blueprint for this house shows the foundation with a length of 2 feet. What should be the width of the foundation on the blueprint?

- 4 Pentagon  $ABCDE$  is similar to pentagon  $VWXYZ$ . What is the length of  $\overline{XY}$ ?



- 5 A picture postcard is being enlarged to create a poster of the same image. If the poster is similar to the postcard, find  $x$ , the width of the poster.



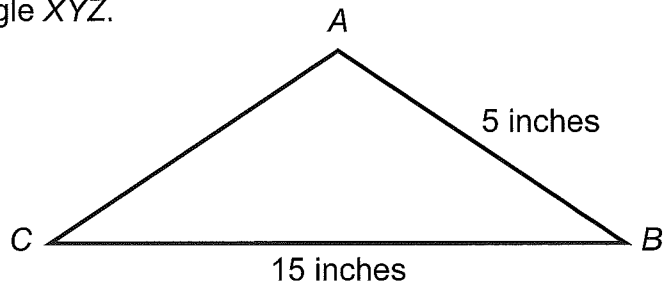


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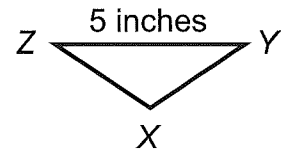
- 6 The Khan family carpeted their game room for a cost of \$1,500. The game room has an area of 100 square feet. They love the carpet so much that they now plan to have the same carpet installed in their daughter's bedroom. They have calculated that the cost to install carpet in the bedroom will be \$1,200. What is the area of the bedroom?

- 7 Isosceles triangle  $ABC$  is similar to triangle  $XYZ$ .

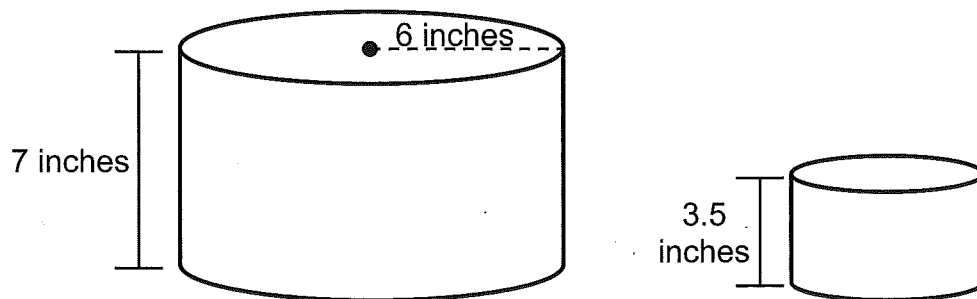
a) Find the length of  $\overline{XZ}$ .



b) If the measure of  $\angle X = 110^\circ$   
what is the measure of  $\angle C$ ?



- 8 The 2 figures shown below are similar. What is the diameter of the smaller cylinder?





### Rascally Rectangles

Rectangle A measures 4 feet by 6 feet. A scale factor of  $\frac{3}{4}$  is applied to Rectangle A to generate Rectangle B.

Rectangle C measures 2 feet by 3 feet. A scale factor of 1.5 is applied to Rectangle C to generate Rectangle D.

Which has the greatest perimeter: Rectangle B or Rectangle D? Justify your answer.

FOR TEACHER USE ONLY:

a. YES NO Student arrives at a correct solution?

	4	3	2	1
b. Conceptual Knowledge				
c. Procedural Knowledge				
d. Communication				





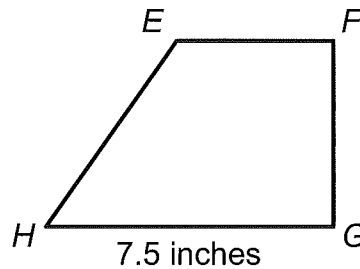
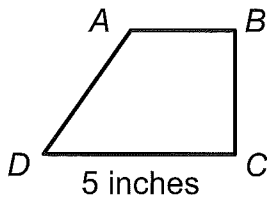
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- 1 Natalie's father is building a dollhouse that is a scale model of their own home. Natalie's bedroom has a length of 15 feet and a width of 10 feet. The length of the corresponding bedroom in the dollhouse is 9 inches. What is the width, in inches, of the dollhouse bedroom?

- A 0.5 inch
  - B 0.75 inch
  - C 4 inches
  - D 6 inches
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- 2 Trapezoid  $ABCD$  is similar to trapezoid  $EFGH$ .

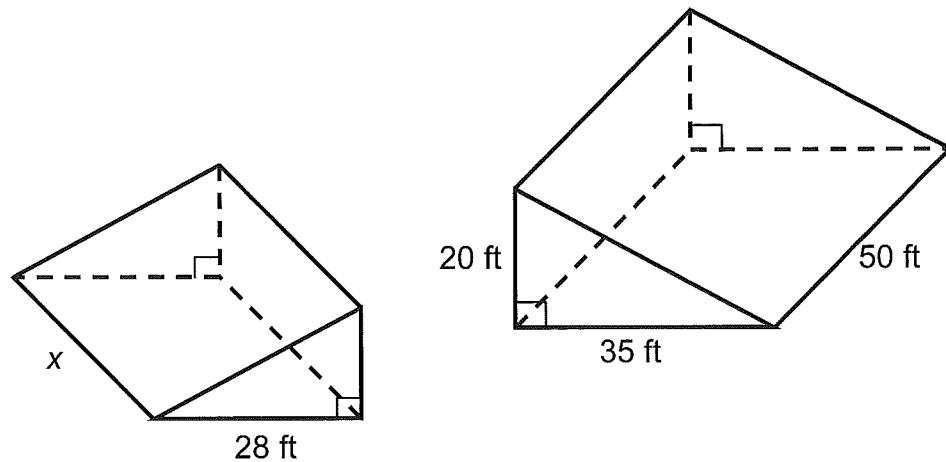


What scale factor was applied to trapezoid  $ABCD$  to create trapezoid  $EFGH$ ?

- A 12.5
- B 2.5
- C 1.5
- D 0.67



- 3 The 2 triangular prisms shown below are similar.



What is  $x$ , the height of the smaller prism?

- A 16 feet
  - B 40 feet
  - C 43 feet
  - D 50 feet
- 4 A photograph has a length of 7 inches and a width of 5 inches. The photograph is enlarged by a scale factor of 2.5. What is the width of the enlarged photograph?
- A 7.5 inches
  - B 9.5 inches
  - C 12.5 inches
  - D 17.5 inches